

Brucellosis

Brucellosis is a Class A Disease. It must be reported to the state within 24 hours by calling the number listed on the website.

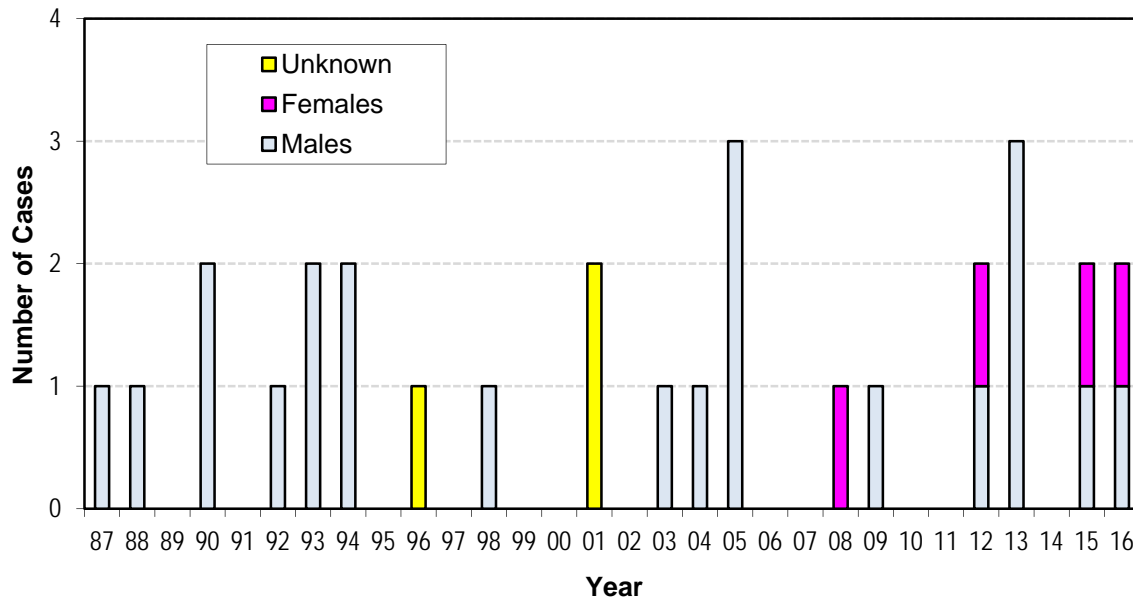
Brucellosis is a zoonotic infection of domesticated and wild animals, caused by bacteria of the genus *Brucella*. Humans become infected by ingestion of food products of animal origin (such as undercooked meat or unpasteurized milk or dairy products), direct contact with infected animals, or inhalation of infectious aerosols.

Brucella abortus (cattle), *B.melitensis* (sheep and goats), *B.suis* (pigs), and *B.canis* (dogs), are the most common species. The most common etiology in the U.S. is *B.melitensis*. Marine *Brucella* (*B.ceti* and *B.pinnipedialis*) may also pose a risk to humans who interact with marine animals; people should avoid contact with stranded or dead marine mammals.

Infection may cause a range of symptoms, including fever, sweats, malaise, anorexia, headache, joint and muscle pain, and fatigue. Some symptoms may last for prolonged periods of time including recurrent fevers, arthritis, swelling of the testicle and scrotum area, swelling of the heart, swelling of the liver and/or spleen, neurologic symptoms, chronic fatigue, and depression. Treatment consists of antibiotics, but recovery may take a few weeks to several months.

Bovine brucellosis caused by *B. abortus*, is a bacterial infection transmitted through oral exposure to uterine discharges from infected cows at time of calving or abortion. This previously common disease has been eliminated from the state through the cooperation of the cattle industry and state-federal animal health officials. On November 1, 2000, Louisiana was declared free of brucellosis in cattle. Immunization of female cattle was an important component in the eradication effort.

In the U.S., there are approximately 100 cases reported per year. Since 1987, there have been only sporadic cases of brucellosis in humans in Louisiana with most of the cases occurring in males. Three cases were reported in 2013, all of which were due to *B.suis* with the patients reporting cutting their hands while preparing raw hog meat (Figure 1).

Figure 1: Brucellosis cases - Louisiana, 1987-2016

The groups most at risk for brucellosis are abattoir workers, meat inspectors, animal handlers, veterinarians and laboratory workers.

Methods of prevention include avoiding consumption of undercooked meat and unpasteurized dairy products. A growing trend toward consumption of “farm-fresh” or “organic” unpasteurized dairy products is a cause for concern by public health officials. People who handle animals and animal tissues should protect themselves by using personal protective equipment (PPE) including rubber gloves, gowns or aprons and goggles.

Throughout the period of 2008 to 2016, there have been 11 cases of brucellosis in Louisiana that were reported (Table).

Table: Summary of brucellosis cases – Louisiana, 2008-2016

Year	#	Species	Possible Exposure	Age/Sex	Occupation
2008	1	Not specified	Dog bite	12; F	Student
2009	2	<i>Melitensis</i>	Helped nurse a calf, owns multiple	62; M	Retired
2012	3	<i>Melitensis</i>	Skinning/slaughtering pigs	63; M	Truck Driver
2012	4	<i>Suis</i>	Skinning/slaughtering pigs	71; F	Not
2013	5	<i>Suis</i>	Raw hog meat contact with open	36; M	Not
2013	6	<i>Suis</i>	Skinning/slaughtering squirrels	45; M	Construction
2013	7	<i>Suis</i>	Slaughtering pigs	38; M	Not
2015	8	Not specified	Pet dogs, unspecified	34; F	Customer
2015	9	<i>Melitensis</i>	Skinning/slaughtering pigs	53; M	Not
2016	10	<i>Melitensis</i>	Cheese from unpasteurized milk	32; F	Not
2016	11	Not specified	Skinning/slaughtering pigs and deer	44; M	Mechanic

Case Descriptions

Case #1 – In 2008, this is a confirmed brucellosis case whose symptoms included intermittent fever, body aches, weakness, headache, and malaise. The family of Case #1 purchased a six-week-old puppy that was at the time ill and treated for parasites by their veterinarian. A couple of weeks prior to diagnosis, Case #1 was bitten on the lip by the dog. The dog was roughly six-months-old when this occurred. No brucellosis test was done on the dog to determine if it was the source of Case #1's illness.

Case #2 – In 2009, this confirmed brucellosis case had symptoms which included intermittent fever, chills, weight loss, sweating, body aches, weakness, malaise, and anorexia. He had owned a cow for about 10 years and also purchased a calf from a stockyard sale. The calf was not nursing very well, so in an attempt to make it nurse better, he stuck his fingers in raw milk and let the calf suck on them so it might learn how to properly nurse. This case also remembers that the winter prior to his diagnosis, his son killed a wild hog, and he helped dress it afterwards.

Case #3 – In 2012, this confirmed brucellosis case experienced symptoms that included fever, night sweats, and chest pains. This case also came in contact with pigs when he would skin and slaughter them.

Case #4 – In 2012, this case experienced fever, night sweats, and headaches. This case also would skin/slaughter pigs.

Case #5 – In 2013, this confirmed brucellosis case had symptoms consistent with unspecified pneumonia. This case handled wild hog meat that was shot in Texas, which was then exposed to an open wound on the hand.

Case #6 – In 2013, this confirmed brucellosis case had symptoms of night sweats, chills, and lower back pain, but no fever. This case was a construction worker, who had been exposed to deer and squirrel skin after it was slaughtered.

Case #7 – In 2013, this confirmed brucellosis case was hospitalized on two separate occasions for fever, weight loss, headaches, and diarrhea. This case had slaughtered a hog two weeks prior to presenting with symptoms.

Case #8 – In 2015, this brucellosis case had no contact with animals at home (other than indoor pets) nor animal products at work. This case had no known exposure to unpasteurized dairy or undercooked meat. The case did not have any sick contacts.

Case #9 – In 2015, this confirmed brucellosis case went hunting in Louisiana, shot one deer and "cleaned" a wild hog.

Case #10 – In 2016, this confirmed brucellosis case experienced fatigue, fever, headache, myalgia, and weight loss. This case consumed cheese made from unpasteurized goat milk which was imported from Mexico.

Case #11 – In 2016, this confirmed brucellosis case experienced arthralgia, fatigue, fever, headache, night sweats, and weight loss. This case killed and slaughtered pigs and deer before developing symptoms.

Discussion:

The annual incidence rate of brucellosis in Louisiana is 1.7 cases per 10 million individuals. The U.S., in comparison, has an incidence rate of 3.25 brucellosis cases per 10 million individuals. These rates exemplify how rare brucellosis is as an infectious disease in humans, not only in Louisiana but also the entire United States. Although brucellosis is not as common as the flu, it is still critical that it be monitored continuously due to its potential threat to not only the livestock population, but also certain occupational/recreational groups.

It is important to keep in mind those individuals that make up the high-risk occupational groups, such as lab personnel and livestock handlers. Laboratory workers are at a greater risk for contracting a *Brucella* infection because these technicians are more likely to come in contact with an actual culture of the bacteria on a daily basis. Likewise, livestock handlers have an equally high risk because they may also be dealing with animal carcasses and so would also be a part of the high risk group.

There is growing concern in the southeast region of the U.S. for *B. suis*, or ‘swine brucellosis’. Feral hogs can tolerate a wide range of climates and are opportunistic omnivores; they will eat almost anything. They are only vulnerable to predation when they are young. Feral hogs also have the ability to reproduce rapidly and can begin doing so as early as six months of age.

Recently, in Louisiana, there have been three cases of *B.suis* that were diagnosed in 2013. The June 12, 2009 issue of the Morbidity and Mortality Weekly Report, published by the Centers for Disease Control and Prevention reported three cases of *B.suis* infection throughout three states: South Carolina, Pennsylvania and Florida. These cases presented with *B.suis* infection, all experiencing flu-like symptoms, after having participated in feral swine hunting which took place in Florida. State Health Departments of South Carolina and Pennsylvania had to conduct a joint investigation with Florida’s State Health Department in order to accurately confirm the source of these cases’ illnesses. Since the symptoms of a brucellosis infection are often flu-like, and can take as long as six months to appear, it is possible that *B.suis* cases may be under reported. This makes it very important for physicians to inquire about travel history, recreational activities, food consumption and occupation when patients present with nonspecific flu-like symptoms. The best method for preventing *B.suis* infection will have to include education for hunters concerning safe practices of butchering, dressing, and cooking of the game meat. Regardless of what type of *Brucella* infection is diagnosed, all should be investigated both by the state health department and any agricultural agencies in order to determine the true source of the infection, and to prevent any further infections in humans.

Efforts to completely eradicate brucellosis from the U.S. began back in 1934 when *B.abortus* was very common among the cattle population. The Brucellosis Eradication Program was established between the states, the federal government, and livestock operations. The program has made great strides now that there are no longer any known affected cattle herds. Even though the advancements in technology have made elimination of brucellosis more effective as compared to 1934, the program still emphasizes the importance of a diligent surveillance system that all states should adhere to in order to maintain this eradication. Documented cases have occurred in livestock populations even in areas that are considered *Brucella* -free. It is likely that these cases are the result of transmission from wildlife which further emphasizes the importance of surveillance. Without a proper surveillance system in place, the source of the disease will not

be found allowing further infections to occur. Education, surveillance, and thorough investigations of potential brucellosis cases are essential at keeping this disease rare and non-threatening to the population.